



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX

75 Hawthorne Street
San Francisco, CA 94105-3901

APR 13 2004

Phil Woodward
California Regional Water Quality Control Board
Central Valley Region
415 Knollcrest Drive
Redding, CA 96002

Dear Mr. Woodward:

EPA staff have reviewed the April 2004 *Draft Staff Report for Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins for Beneficial Uses at West Squaw Creek, Shasta County*, and the accompanying February 2004 *Draft Use Attainability Analysis (UAA)*. We appreciate your agreement to allow us additional time to submit our comments on these documents. We have completed our review. This letter summarizes the primary reasons we are unable to support the proposed amendments, as written. Our comments on specific details of the draft documents are enclosed. We would appreciate a written response to our letter and comments, and recommend deferral of Regional Board action on the proposed amendments until such time as the matters outlined herein are resolved.

EPA previously provided comments on the February 2003 draft UAA for West Squaw Creek. In that draft, Regional Board staff proposed to designate West Squaw Creek for "limited" aquatic life uses and to establish site-specific copper, cadmium, zinc, and pH objectives for the Creek. In our comments on that draft, we advised that the UAA lacked sufficient data, documentation, and analysis to support a determination of whether the proposed beneficial use modifications and site-specific objectives were warranted and appropriate. In addition to requesting additional data and clarification regarding the basis for the proposed use modification and site-specific objectives, we recommended consideration of other options, such as TMDL development or requesting the State Board to exercise the case-by-case exception authority provided in its *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California*. EPA advised that these alternative actions could provide the desired near-term relief and flexibility, while retaining the regulatory incentive for continued progress toward attainment of water quality standards. We continue to recommend they be considered.

The current draft UAA and Basin Plan amendments propose to completely omit COLD, WARM, and SPWN (warm and cold) from the uses designated for West Squaw Creek, saying that these uses are not "existing" under the Clean Water Act (CWA). We disagree. The documented presence, within recent years, of macroinvertebrates and periphyton throughout West Squaw Creek, and fish (including rainbow trout) in the upper reaches of the Creek, clearly

demonstrate the existence of aquatic life uses in this stream. Under the CWA, existing uses can not be removed.

The current proposal does not include site specific objectives; however, the Staff Report indicates that, if the COLD, WARM, and SPWN uses are removed, the cadmium, copper, and zinc objectives contained in Table III-1 of the Basin Plan would no longer apply to West Squaw Creek. This does not appear to be the case. Since the Basin Plan applies the referenced objectives to West Squaw Creek on a solely geographic basis, rather than by tying them to any particular beneficial uses, those objectives would continue to apply. Objectives for other parameters, such as dissolved oxygen, pH, and temperature, however, would be altered by the removal of WARM and COLD use designations.

The Regional Board's April 2002 *Upper Sacramento River TMDL for Cadmium, Copper, and Zinc* allocates average dissolved copper and zinc concentrations of 1.3 $\mu\text{g/l}$ and 3.9 $\mu\text{g/l}$, respectively, to Shasta Dam releases to enable metals loading targets to be met downstream by Keswick Dam releases. The management strategy for that TMDL is based, in part, on assumptions that existing permits for mines in the Shasta Lake area will be enforced to assure maximum removal or containment of heavy metals, and responsible parties will increase remediation efforts at those mines, as needed, during the next five to ten years. Any actions taken regarding water quality standards for West Squaw Creek should be consistent with that strategy and not jeopardize compliance with the TMDL by the Shasta Dam releases.

In designating beneficial uses and associated criteria for a water body, states are required, under 40 CFR 131.10(b), to "...ensure that its water quality standards provide for the attainment and maintenance of the water quality standards of downstream waters". It is not clear, from the information provided in the draft UAA and Staff Report whether or not the proposed amendments would protect the designated uses in Shasta Lake. The Upper Sacramento TMDL notes that the Regional Board intends to develop a separate TMDL to address individual sources of dissolved cadmium, copper, and zinc to Shasta Lake. In the absence of that separate TMDL, the assertion, in the proposed Basin Plan amendment, that relaxation of the objectives applicable to West Squaw Creek "will allow for greater overall reduction in metal loading to Lake Shasta and the Sacramento River" by allowing Mining Remedial Recovery Corporation "to focus its available resources on additional sources of ARD in other watersheds" cannot be adequately evaluated.


Statements in the UAA and proposed amendments suggesting that all feasible remedial measures to address acid mine drainage to West Squaw Creek have been exhausted and are insufficient to attain applicable water quality standards seem premature. It appears that results are not yet available for all of the recent remedial actions, and additional remedial actions are planned that may result in further reduction of metals loading and/or concentrations. The draft Staff Report and UAA do not provide the necessary level of engineering detail to support a determination that the beneficial uses proposed for de-designation cannot be attained through the implementation of additional currently available remedial technologies. Both documents discuss

the identified potential technologies only in very general terms, and neither provides an engineering analysis of the feasibility of applying specific technologies to specific sources of metal discharges. EPA's experience at the Iron Mountain Mine site suggests that additional remedial measures that could substantially reduce metals loading to West Squaw Creek have not been given adequate consideration.

In summary, we strongly recommend that Regional Board staff reconsider its approach to addressing the impairment of West Squaw Creek. Since aquatic life are present in the Creek, complete removal of the WARM, COLD, and SPWN uses is not appropriate; however, given the currently limited species assemblages in certain segments of the Creek, some modification of the use designations for those segments may be warranted to more precisely define the existing vs potential uses. A more thorough engineering analysis than is currently provided in the UAA is needed to demonstrate that "human caused conditions or sources of pollution . . . cannot be remedied or would cause more environmental damage to correct than to leave in place", if this remains the UAA factor upon which the Regional Board wishes to base such use modification. If Regional Board staff believe that the currently applicable objectives are unattainable, the scientific basis for any proposed alternative objectives to protect the existing and attainable (potential) uses must be clearly presented. Please see EPA's August 15, 2003 letter, regarding the February 2003 draft UAA, for comments regarding site-specific objectives for West Squaw Creek. Furthermore, any proposed changes to the water quality standards applicable to West Squaw Creek should be evaluated in the context of the Regional Board's April 2002 Upper Sacramento River TMDL for Cadmium, Copper, and Zinc.

If you have any questions regarding EPA's comments, please contact me. I can be reached via email at Goforth.Kathleen@epa.gov or via phone at 415-972-3521.

Sincerely,



Kathleen Martyn Goforth
Water Quality Standards Coordinator
CWA Standards & Permits Office
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Enclosure

cc: Betty Yee (RWQCB Central Valley, Sacramento)
Rick Sugarek (SFD-7-2)
Debra Denton (WTR-2)

ENCLOSURE A

EPA'S COMMENTS REGARDING SPECIFIC DETAILS
OF THE APRIL 2004
DRAFT STAFF REPORT AND FUNCTIONAL EQUIVALENT DOCUMENT
FOR
AMENDMENTS TO
THE WATER QUALITY CONTROL PLAN
FOR THE SACRAMENTO RIVER AND SAN JOAQUIN RIVER BASINS
FOR BENEFICIAL USES AT WEST SQUAW CREEK, SHASTA COUNTY

1. Page 3, 3rd paragraph: *"In accordance with the permit, metal loading (copper, cadmium and zinc) from point sources must be reduced by 99 percent . . ."*

Please identify the baseline against which this reduction is measured for each metal.

2. Page 3, last paragraph: *"Some abandoned and historic mine sites, such as those in the West Squaw Creek drainage, are unique from other NPDES regulated discharges. Due to the remoteness and steepness of the terrain in the vicinity of the mines, and the nature of the sources areas (both point and non-point), many remedial technologies are not economically or technically feasible. Further, as remedial efforts are implemented to address the major discharges of metals to the watercourses, costs increase exponentially to address the remaining, generally smaller and more complex, sources."*

It is not clear what sets the mines in the West Squaw Creek drainage apart such that remedial technologies that are feasible at other mine sites in the West Shasta area, which are also located in steep, remote terrain and involve both point and nonpoint sources, are infeasible in the West Squaw Creek drainage. It is common in many pollution control situations for the unit costs of controlling the last increments of the pollution to exceed those of controlling the bulk of the pollution; however, such costs are not considered a basis for beneficial use removal under 40 CFR 131.10(g)(3), which is cited on page 13 as the use removal factor upon which the draft UAA is based.

3. Page 5, last paragraph: *"The affect [sic] of a Basin Plan amendment removing those uses would be to have the RWQCB delete relevant requirements from the NPDES permits."*

This statement seems contradictory to the statement on page 2 of the draft UAA that, "[w]hen this amendment is adopted, discharges from the abandoned mines in the West Squaw Creek watershed will be in compliance with the existing NPDES permit".

4. Page 5, last paragraph: *"This change would allow MRRC to focus its available resources on additional sources of ARD in other watersheds which will allow for greater overall reduction in metal loading to Lake Shasta and the Sacramento River."*

The draft UAA does not support this statement with any data regarding the relative contributions of West Squaw Creek discharges and those in other watersheds. A TMDL for Lake Shasta and its tributaries would provide the appropriate context for considering such trade-offs.

5. Page 6, 3rd paragraph: *"Following construction and filling of Shasta Dam, completed in 1945, fish kills were documented from ARD in the vicinity of the West Shasta Copper Mining District. These included fish in the West Squaw Creek arm of the lake immediately adjacent to the mouth of West Squaw Creek."*

The occurrence of fish kills "immediately adjacent to the mouth of West Squaw Creek" suggests that fish may have inhabited or opportunistically used the lower reaches of the Creek even prior to the initiation of remedial activities. Does the available documentation indicate which species of fish were found? In the absence of survey results to the contrary, we caution against assuming that fish have not used the lower reaches of the Creek at any time since November 28, 1975, given the improvements in water quality that have been achieved in that time.

6. Page 7, 2nd paragraph: *"These objectives are also exceeded in portions of West Squaw Creek not directly impacted by past mining activities."*

To which portions of West Squaw Creek does this statement refer? Please provide the supporting data.

7. Page 10, 2nd paragraph: *"In implementing this goal, USEPA requires that states designate all waters as supporting a fishery and contact recreation."*

This is incorrect. As noted in the sentences preceding this one, EPA's regulations require states to "take into consideration the use and value of water for various uses, including 'protection and propagation of fish, shellfish and wildlife' and 'recreation in and on the water'", but allow these Clean Water Act goal uses to be removed, sub-categorized, or omitted from designation if their attainment is demonstrated, through a Use Attainability Analysis, to be infeasible due to one or more of the use attainability factors provided in 40 CFR 131.10(g).

8. Page 10, 3rd paragraph: *"Existing uses must be fully protected and cannot be removed (40 CFR 131.12(a)(1))."*

The prohibition of removing an existing use is found at 40 CFR 131.10(h)(1). The antidegradation regulation at 40 CFR 131.12(a)(1) requires that existing uses and the level of water quality necessary to support such uses be protected.

9. Page 24, "Recommended Alternative": *"Alternative 3 is the recommended alternative since the action would:*

- 1. Be consistent with state and federal water quality laws and policies;*
- 2. Is protective of current and post 1975 beneficial uses and improvements in water quality attained since 1975 . . ."*

EPA disagrees. Removal of the COLD, WARM, and SPWN use designations would be inconsistent with federal water quality laws and regulations because it would not protect the existing aquatic life in West Squaw Creek.

10. Page 25, 2nd paragraph: *"Adoption of Alternative 1 (No Action) would not result in demonstrable benefits to improve water quality and reduce metal loading to West Squaw Creek . . ."*

The basis for this statement is not clear, given that the current designated uses have apparently driven substantial improvements in water quality and reductions in metal loading to date.

11. Page 26, last paragraph: *"The chemical characteristics varied among reaches . . ."*

Rather than the ranges reported in this paragraph, the actual values for pH, hardness, temperature, etc. that were measured at specific locations, and when and how frequently those values were recorded, would be more useful information. For example, was the pH of any reach consistently or usually above 6.5? How often was the pH less than 6.5 in each reach? Since the ranges provided in this paragraph were obtained from a biological assessment conducted "[i]n the fall of 1999", they represent a very limited, and perhaps outdated, snapshot of conditions in the Creek.

12. Page 27, 2nd paragraph: *"Elevated levels were also found in the background reach of upper Squaw Creek where no mining has taken place. Cadmium, copper, and zinc concentrations were measured up to 38.0 µg/l, 2390 µg/l, and 6,020 µg/l, respectively in the affected area of West Squaw Creek."*

How elevated were the levels in the background reach? In which segment(s) of the affected area were the maximum values reported here recorded? Please provide the data for all of the sampled reaches.

13. Page 27, 3rd paragraph: *"Three communities of organisms, periphyton, benthic macro-invertebrates, and fish were collected to assess the biological conditions of the stream."*

The presence of these communities demonstrates that aquatic life uses are existing, as that term is defined in 40 CFR 131.3, in West Squaw Creek.

14. Page 28, 3rd paragraph: *"There seems to be a slight improvement in some of the biological measures at the downstream sites on West Squaw Creek."*

To which downstream sites does this refer?

15. Page 29, 2nd paragraph: *"Impacted portions of West Squaw Creek currently support an acid tolerant benthic invertebrate community. Over time it is the goal of the RWQCB and MRRC to continue to make improvements to stream conditions within the watershed. However, it is unlikely that the stream will ever support beneficial uses of WARM, COLD, and SPWN due to the concentrations of metals from non-point, uncontrollable sources."*

The WARM and COLD use designations, as defined in the Basin Plan, include "uses of water that support [warm/cold] water ecosystems including . . . invertebrates"; therefore, one or the other, if not both, of these uses are existing uses.

16. Page 30, last paragraph: *"If the beneficial uses are modified in the Basin Plan, the water quality objectives listed above would no longer apply to West Squaw Creek."*

The referenced objectives would continue to apply because they are assigned geographically to the "Sacramento River and its tributaries above State Hwy 32 bridge at Hamilton City"; the Basin Plan does not limit their applicability to any particular uses.

17. Page 31, 3rd paragraph: *"Monitoring data from the mine discharges and the receiving waters indicate that even if all portal flows were eliminated and all waste rock dumps adequately controlled, the receiving water concentration of metals from non-point sources in West Squaw Creek would still continue to exceed water quality objectives to protect fish and would prevent the establishment of a warm-water or cold-water fishery or spawning habitat in West Squaw Creek."*

Please provide the data and any associated analyses that support this statement, as well as data that indicate the effectiveness of the controls implemented to date, the expected effectiveness of controls that are currently being implemented or are planned, and the expected water quality in segments of West Squaw Creek. The options for reducing discharges from controllable nonpoint sources should also be discussed.

18. Page 32, 1st paragraph: *"The current metal concentration and loading documented in the watercourse is measured at the West Squaw Creek Bridge, immediately upstream of Shasta Lake."*

The previous draft of the UAA provided data for several other monitoring locations, as well. Why is current monitoring limited to the West Squaw Creek Bridge?

19. Page 32, 2nd paragraph: *"The monthly data presented in the UAA are variable as a result*

of variations in stream flows and metal discharges from precipitation events, season changes, and climate changes. A specific instantaneous number is therefore unrealistic and meaningless for regulatory compliance and data must be averaged over an extended period of time to reduce the natural variability."

Water quality objectives can be established that take natural variability into account. Have Regional Board staff considered establishing seasonal objectives for West Squaw Creek?

20. Page 34, last paragraph: *"The beneficial uses of WARM, COLD, and SPWN are not existing uses as that term is defined in 40 CFR 131.3."*

As noted above, EPA does not agree, due to the presence of aquatic macroinvertebrates, periphyton, and, in some reaches of the creek, fish.

21. Page 35, 1st paragraph: *"It is not feasible to reduce discharges of metals to concentrations sufficient to support WARM, COLD, or SPWN because even if all point source discharges were controlled, naturally occurring non-point source discharges would continue to cause the water to exceed protective concentrations."*

No data are provided in the Staff Report to support this statement. Data provided on page 38 of the draft UAA appear to indicate that background concentrations were below detection limits in the habitat assessment conducted by CA Department of Fish and Game in 1999. If, however, other available data demonstrate that naturally-occurring discharges alone would cause the currently applicable objectives to be exceeded, the Regional Board may wish to consider establishing site-specific water quality objectives for West Squaw Creek based on natural background concentrations.

22. Page 35, 1st paragraph: *"Therefore, removing the beneficial uses of WARM, COLD, and SPWN is consistent with the federal antidegradation policy. The proposed Basin Plan amendments will not affect existing water quality. Water quality in West Squaw Creek will continue to improve incrementally as technology becomes available and best management practices are applied to point and non-point sources as required under the NPDES permit issued to MRRC."*

Removal of the WARM and COLD – and for at least some segments of West Squaw Creek, SPWN – use designations would not be consistent with the federal antidegradation policy because these uses are existing uses, which, under that policy, must be protected. It is not clear, from the information provided, on what basis the permit would require application of additional point and non-point source controls if the use designations that appear to be driving the need for such controls were removed.

23. Page 69, Table 7-1: *"Accessible portals and those with year-round flows are sealed."*

Have the feasibility and likely benefits of sealing portals with seasonal or otherwise intermittent flows been evaluated?

24. Page 69, Table 7-1: *"MRRC has been funding research in this area for the past three years. In-field project studies have been effective. The treatment is being tested at the Stowell Mine with injection occurring in Summer, 2002."*

What were the results of the testing at the Stowell Mine?

25. Page 69, Table 7-1: *"Pipe ARD to Iron Mountain Treatment . . . Low."*

The factors limiting the feasibility of this option should be presented.

ENCLOSURE B

EPA'S COMMENTS REGARDING SPECIFIC DETAILS
OF THE
FEBRUARY 2004 DRAFT REPORT
USE ATTAINABILITY ANALYSIS
WEST SQUAW CREEK WATERSHED, SHASTA COUNTY, CALIFORNIA

1. Page 2, 3rd paragraph: *"When this amendment is adopted, discharges from the abandoned mines in the West Squaw Creek watershed will be in compliance with the existing NPDES permit."*

This suggests that no changes would be made to the existing NPDES permit to reflect the use removals; however, this statement seems contradictory to the statement on page 5 of the draft Staff Report that, "[t]he affect [sic] of a Basin Plan amendment removing those uses would be to have the RWQCB delete relevant requirements from the NPDES permits."

2. Page 8, 3rd paragraph: *"The numeric standards for the Sacramento River and its tributaries above State Highway 32 Bridge, that apply to abandoned copper mines including those in the West Squaw Creek watershed . . ."*

Water quality standards apply to water bodies, not to mines or other pollutant sources.

3. Page 13, 2nd and 3rd paragraphs: *"California Department of Water Resources (DWR) produced a report on the water quality of West Squaw Creek . . . The study also addressed the seasonality of fish kills and suggested remedial measures . . . Fish kills were documented by Hansen and Weidlein (1974). Their investigation evaluated West Squaw Creek from September 1968 to July 1969 . . . As fish kills occurred, the species were identified . . . Two major conclusions reached by Hansen and Weidlein were . . . fish kills are related to the time and location of fish planting . . ."*

Did the reported fish kills occur in the Creek itself or in the lake at the mouth of the Creek? Which species were involved? Did/does fish planting occur in West Squaw Creek? If so, did this practice continue or occur at any time after November 28, 1975?

4. Page 13, 3rd paragraph: *"The difference in surface-to-bottom concentrations of copper suggested stratification regardless of the time of year . . ."*

At what stratum were the highest concentrations generally found?

5. Page 13, 3rd paragraph: *"Two major conclusions reached by Hansen and Weidlein were: . . . (2) toxic copper concentrations extend a minimum of 1,645 meters into Shasta Lake*

from the mouth of West Squaw Creek."

The referenced data were collected in 1968 and 1969. What are the current conditions in the West Squaw arm of Shasta Lake? Under 40 CFR 131.10(b), when designating uses and criteria for a water body, states are required to "... ensure that its water quality standards provide for the attainment and maintenance of the water quality standards of downstream waters." The UAA should demonstrate that attainment and maintenance of the water quality standards for Shasta Lake would not be jeopardized by the proposed amendments.

6. Page 22, 4th paragraph: *"Average annual dissolved copper, cadmium, and zinc concentrations for the sample location at the West Squaw Creek Bridge are summarized in Table 2-6..."*

It would be helpful to see the raw data for recent years since annual averages do not reflect seasonal variability nor allow assessment of the frequency with, and magnitude by, which the objectives are exceeded.

7. Pages 23-25, Tables 2-3, 2-4, and 2-5: Are the values in these tables averages or maximum values?
8. Pages 23-25, Tables 2-3, 2-4, and 2-5: These tables indicate that substantial percent reductions in metals loading are anticipated by 2004. What metals concentrations are likely to be attained through these loading reductions?
9. Page 26, Table 2-6: Please provide the units for this table.
10. Page 26, Table 2-6: *"2003 copper average does not include three samples analyzed by MRRC at its in-house laboratory. If these results are included, the average dissolved copper concentration for 2003 is 11 µg/L."*

Why were the values for those three samples not included?

11. Page 30, section 3.2 Stream Segment Identification: The descriptions of the stream segments differ from those in the previous draft of the UAA in terms of the number of segments and the length of each segment/tributary (for example, segments EB and PA are each described in the current draft as being approximately twice as long as they were in the previous draft). Do these changes correct inaccuracies in the previous draft or indicate changes to the scope of the geographic area covered by the UAA? The previous draft identified the East Fork of Weil tributary as an impacted segment. Why is that fork not discussed in the current draft? Also, the previous draft broke segment WSC into three segments, and indicated that the upper segment (between Early Bird confluence and Windy Creek confluence) was close to meeting objectives, while the lower segments

substantially exceeded the objectives. What is the rationale for omitting this distinction?

12. Page 32, 4th paragraph: *"In order to evaluate 'natural' conditions in the West Squaw Creek watershed, Shepard Miller (1996a) conducted an evaluation using Runnels methods. This evaluation illustrates that the numeric objectives in the Basin Plan for the protection of a warm and cold-water fisheries are unrealistic in areas with significant metal sulfide deposits."*

Based upon work performed by the U.S. Geological Survey for EPA at Iron Mountain mine, where Shepard Miller performed a similar study, this approach overestimated the pre-mining metal concentrations by a factor of 700. Three studies performed for EPA at Iron Mountain Mine portray a consistent picture that indicates that aquatic life existed in the streams adjacent to the massive mineralized body at Iron Mountain prior to mining.

13. Pages 37-40, Sections 3.4.1 and 3.4.2 regarding Physical Habitat Assessment: Table 3-3 shows significant differences between the concentrations found in the background reaches and reach WSC-2 versus those found in reaches WSC-3 through WSC-7. This distinction should be reflected more clearly in the text. For example, the third paragraph on page 40 begins, "[c]opper concentrations in West Squaw Creek were >2000 µg/l", although such levels were only found in three of the seven sampled reaches of the Creek. Also, the 4th paragraph on page 40 states, "[z]inc concentrations at the downstream West Squaw Creek sites were in excess of 4,500 µg/l". This is misleading, since only WSC-3, WSC-4, and WSC-5 were in that range. The two sites furthest downstream -- WSC-6 and WSC-7 -- had zinc concentrations of 1,780 µg/l and 613 µg/l, respectively. It appears that the cadmium, copper, and zinc concentrations at the background sites, as well as at WSC-2 and WSC-7 (for copper only) were all below detection limits. We recommend that those sites be re-sampled and analyzed using available methods with lower detection limits to provide a more precise assessment of ambient concentrations relative to the applicable objectives.
14. Page 47, Table 3-5: The discussion of WSC-3 notes that "[n]o fish were identified at this site"; however, the discussions of WSC-4 and WSC-5 say "[n]o fish were observed at this site". Were fish observed, but not identified as to species, at WSC-3, or was no distinction intended between "identified" and "observed"?